

Amendments to the Claims

1           1.       (Currently amended) A computer implemented method of performing a  
2 transaction in a database system, comprising:

3                   receiving a transaction to be performed, wherein the transaction is  
4 processed by a plurality of access modules; and

5                   before any directive indicating commencement of an end transaction  
6 procedure is broadcast to the access modules, performing a flush of a transaction log  
7 from volatile storage to non-volatile storage by each of the access modules before  
8 ~~execution of an end transaction procedure begins.~~

1           2.       (Currently amended) The method of claim 1, further comprising issuing a  
2 request to flush the transaction log with a message sent to each of the access modules for  
3 performing a last step of the transaction, the last step performed prior to commencement  
4 of the end transaction procedure.

1           3.       (Currently amended) The method of claim 2, further comprising  
2 performing the flush of the transaction log in a data access step prior to commencement  
3 of the end transaction procedure to avoid performance of a transaction log flush in the  
4 end transaction procedure.

1           4.       (Previously presented) The method of claim 2, further comprising  
2 determining that the last step is being performed by all of the plurality of access modules  
3 involved in the transaction.

1           5.       (Original) The method of claim 1, further comprising determining if the  
2 transaction log has been flushed before performing the end transaction procedure.

1           6.       (Original) The method of claim 5, further comprising avoiding  
2 performance of a transaction log flush in the end transaction procedure if the transaction  
3 log has been flushed.

- 1           7.     (Original) The method of claim 1, further comprising:  
2                 identifying the transaction as an implicit transaction.
- 1           8.     (Currently amended) The method of claim 1, further comprising:  
2                 performing the end transaction procedure, ~~which follows execution of the~~  
3 ~~transaction.~~
- 1           9.     (Currently amended) The method of claim 8, performing the end  
2 transaction procedure comprising:  
3                 skipping broadcast of a the directive indicating commencement of the end  
4 transaction procedure to the plurality of access modules.
- 1           10.    (Currently amended) A computer implemented method of performing an  
2 end transaction procedure in a database system, comprising:  
3                 after commitment of a transaction, a first access module in the database  
4 system writing an end transaction indication to a first transaction log portion in volatile  
5 storage, the first access module being part of a cluster of access modules; and  
6                 the first access module sending an end transaction directive to a fallback  
7 access module associated with the first access module, the fallback access module being  
8 part of the cluster.
- 1           11.    (Currently amended) The method of claim 10, wherein the first access  
2 module sends the end transaction directive to the fallback access module but not to other  
3 access modules in the cluster.
- 1           12.    (Original) The method of claim 10, wherein sending the end transaction  
2 directive comprises sending an end transaction-part one directive.

1           13.     (Currently amended) The method of claim 12, further comprising the ~~first~~  
2     ~~fallback~~ access module broadcasting an end transaction-part two directive to all access  
3     modules in the cluster.

1           14.     (Currently amended) The method of claim 10, further comprising the  
2     fallback ~~access~~ module writing an end transaction indication to a second transaction log  
3     portion in volatile storage.

1           15.     (Previously presented) The method of claim 10, further comprising the  
2     first access module flushing the first transaction log portion from volatile storage to non-  
3     volatile storage.

1           16.     (Currently amended) The method of claim 10, further comprising the first  
2     access module flushing the first transaction log portions from volatile storage to non-  
3     volatile storage but the other access modules in the cluster not flushing their respective  
4     transaction log portions.

1           17.     (Currently amended) A database system comprising:  
2                   ~~a plurality of storage media, the storage media comprising persistent~~  
3     storage;  
4                   volatile storage; and  
5                   a plurality of access modules, wherein each access module is coupled to  
6     ~~one of the plurality of the persistent storage media and the volatile storage; and~~  
7                   each of the access modules being adapted to flush a transaction log  
8     maintained by the access module from the volatile storage to the persistent storage before  
9     ~~execution of any directive indicating commencement of an end transaction procedure~~  
10    begins is broadcast to the access modules.

1           18.     (Currently amended) The database system of claim 17, further comprising  
2     a controller adapted to determine if each access module has flushed the transaction log  
3     maintained by the access module before commencement of the end transaction procedure.

1           19.     (Currently amended) The database system of claim 18, wherein the  
2 controller is adapted to skip sending a directive to perform a transaction log flush if the  
3 controller determines that each access module has flushed the transaction log before  
4 commencement of the end transaction procedure.

1           20.     (Currently amended) The database system of claim 17, further comprising  
2 a controller adapted to provide a flush directive with a message to each of the access  
3 modules to perform a last step of the transaction before commencement of the end  
4 transaction procedure.

1           21.     (Currently amended) An article comprising a computer readable storage  
2 medium storing instructions for enabling a processor-based system to:  
3                   receive a transaction to be performed, wherein the transaction is processed  
4 by a plurality of access modules;  
5                   determine that a last step of the transaction involves the plurality of access  
6 modules, wherein the last step is performed before ~~execution~~ any directive indicating  
7 commencement of an end transaction procedure ~~begins~~ is broadcast to the access  
8 modules; and  
9                   flush a transaction log from volatile storage to a non-volatile storage while  
10 the last step is performed by the plurality of access modules.

1           22.     (Previously presented) The article of claim 21, further storing instructions  
2 for enabling the processor-based system to:  
3                   perform the end transaction procedure, wherein the end transaction  
4 procedure follows execution of the last step of the transaction.

1           23.     (Currently amended) The article of claim 22, further storing instructions  
2 for enabling a the processor-based system to:  
3                   avoid broadcast of any directive indicating commencement of the end  
4 transaction procedure to the plurality of access modules.

1           24.     (Currently amended) A computer implemented method of performing a  
2 transaction in a database system, comprising:  
3                     receiving a transaction to be performed on plural access modules in the  
4 database system;  
5                     maintaining a log in volatile storage to track operations performed in the  
6 transaction; and  
7                     writing the log to persistent storage before ~~start~~ any directive indicating  
8 commencement of an end transaction procedure is broadcast to the plural access modules.

1           25.     (Original) The method of claim 24, wherein writing the log to persistent  
2 storage comprises flushing the log.

1           26.     (Original) The method of claim 24, wherein maintaining the log comprises  
2 maintaining a transaction log.

1           27.     (Original) The method of claim 24, further comprising performing the end  
2 transaction procedure, the end transaction procedure comprising writing an end  
3 transaction indication into the log.

1           28.     (Currently amended) A database system comprising:  
2 ~~storage media comprising~~ persistent storage;  
3 volatile storage;  
4 access modules coupled to the ~~storage media~~ persistent storage and the  
5 volatile storage; and  
6 a parsing engine coupled to the access modules, the parsing engine  
7 adapted to perform one of:  
8                     (a)     providing a directive with a message to perform a last step  
9 of a transaction and communicating the directive to the access modules, each access  
10 module responsive to the directive to perform a transaction log flush from the volatile

11 storage to the persistent storage before ~~execution~~ any directive indicating commencement  
12 of an end transaction procedure ~~begins~~ is broadcast to the access modules; and

13 (b) determining if each of the access modules has performed a  
14 transaction log flush before start of the end transaction procedure;

15 the parsing engine adapted to avoid sending a broadcast directive to the  
16 access modules to cause performance of a transaction log flush during the end transaction  
17 procedure.

1 29. (Previously presented) The method of claim 1, wherein the transaction  
2 comprises plural steps, the method further comprising:

3 performing the plural steps prior to performing the end transaction  
4 procedure, and

5 wherein performing the flush of the transaction log comprises performing  
6 the flush of the transaction log in one of the plural steps.

1 30. (Previously presented) The method of claim 29, wherein performing the  
2 plural steps comprises performing, in each of the plural steps, access of relational table  
3 data stored in the database system.

1 31. (Currently amended) The method of claim ~~30~~29, wherein performing the  
2 flush of the transaction log in one of the plural steps comprises performing the flush of  
3 the transaction log in a last one of the plural steps.

1 32. (Currently amended) The method of claim 31, further comprising each  
2 access module adding a first entry to the transaction log to redo the transaction by the  
3 access module in case of system failure.

1 33. (Currently amended) The method of claim 4, wherein performing the flush  
2 of the transaction log is prior to commencement of the end transaction procedure if the  
3 last step is performed by all of the plurality of access modules, the method further  
4 comprising:

5 performing the flush of the transaction log in the end transaction  
6 procedure if the last step is not performed by all of the plurality of access modules.

1 34. (Currently amended) The database system of claim 17, wherein the access  
2 modules are further adapted to perform a transaction comprising plural steps, ~~one or more~~  
3 ~~of the access modules adapted to perform the plural steps prior to the end transaction~~  
4 ~~procedure~~, and the access modules adapted to perform the flush of the transaction log in  
5 one of the plural steps.

1 35. (Previously presented) The database system of claim 34, wherein the one  
2 of the plural steps comprises a last one of the steps.

1 36. (Previously presented) The database system of claim 35, wherein the  
2 transaction log comprises a first entry associated with each access module to enable a  
3 redo of the transaction in case of system failure.

1 37. (Previously presented) The database system of claim 36, wherein the  
2 transaction log further comprises a second entry associated with each access module to  
3 enable an undo of the transaction.

1 38. (Currently amended) The database system of claim 34, further comprising  
2 a controller adapted to determine whether a last one of the steps involves all the access  
3 modules, and in response to determining that the last one of the steps involves all the  
4 access modules, the controller further adapted to send a directive to all the access  
5 modules to perform the flush of the transaction log in the last one of the steps.

1 39. (Currently amended) The database system of claim 38, in response to  
2 determining that the last step does not involve all access modules, the controller further  
3 adapted to send a directive to perform the flush of the transaction log in the end  
4 transaction procedure.

1           40.     (Currently amended) The article of claim 21, wherein the transaction  
2 comprises plural steps, the article further storing instructions for enabling a the processor-  
3 based system to:

4                     perform the plural steps prior to ~~performing~~ commencement of the end  
5 transaction procedure, and

6                     wherein performing the flush of the transaction log comprises performing  
7 the flush of the transaction log in one of the plural steps.

1           41.     (Currently amended) The article of claim 40, wherein performing the  
2 plural steps comprises performing, in each of the plural steps, access of relational table  
3 data stored in ~~the~~ a database system.

1           42.     (Currently amended) The article of claim ~~41~~0, wherein performing the  
2 flush of the transaction log in one of the plural steps comprises performing the flush of  
3 the transaction log in a last one of the plural steps.

1           43.     (Currently amended) The article of claim 42, further storing instructions  
2 for enabling a the processor-based system to cause each access module to add a first entry  
3 to the transaction log to redo the transaction by the access module in case of system  
4 failure.